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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,781	01/12/2004	Karl-Erik Olsson	07589.0150.PCUS00	1780

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WASHINGTON, DC 20005

EXAMINER
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DAY, HERNG DER

ART UNIT	PAPER NUMBER
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2128

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/19/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/707,781

Applicant(s)

OLSSON, KARL-ERIK

Examiner

Herng-der Day

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 1/12/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Claims 1-28 have been examined and rejected.
2. Applicant is advised that should, (1) claim 1 be found allowable, claim 2 and its dependent claims will be objected to, and (2) claim 27 be found allowable, claim 28 will be objected to, under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Drawings***

3. The drawings are objected to for the following reasons. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include **all** of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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3-1. The label of Y axis " $T/T_o - 1$ " as shown in FIG 2 and FIG 3 is inconsistent with the description in, for example, paragraph [0060].

### *Specification*

4. The disclosure is objected to because of the following informalities. Appropriate correction is required.

4-1. To be consistent with the " $\alpha$ " in paragraph [0036], it appears that the "a" as shown in paragraphs [0035] and [0058] should be " $\alpha$ ".

4-2. It appears that the " $T_u + AT$ " as shown in paragraph [0072] should be " $T_u + \Delta T$ ".

4-3. It appears that the "upper curve 0" as described in paragraphs [0082] and [0083], should be "upper curve O".

4-4. It appears that "andn1" as described in line 2 of paragraph [0097] should be "and n1".

4-5. To be consistent with the " $\alpha$ " in paragraph [0111], it appears that the "a" as shown in paragraph [0110] should be " $\alpha$ ".

4-6. References [1], [2], and [3] as described in paragraphs [0045], [0053], and [0062] need to be identified.

5. The Examiner requests a copy of each document referred to in the paragraph [0119] of the specification because they appear to be reasonably necessary to the examination of this application and cannot be found.

***Claim Objections***

6. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, Applicant's sequence will not be changed. See MPEP § 608.01(n).

7. Each of the independent claims 1, 2, 27, and 28 sets forth a plurality of steps. Each step in each of the independent claims should be separated by a line indentation. 37 CFR 1.75(i).

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 1 recites the limitation, "utilizing the values for the total temperature as a measure of said damage" and independent claims 2, 27, and 28 recite the limitation, "the values for the total temperature being used as a measure of said damage". However, to calculate the damage values D1 and D2 as shown in the equations in paragraphs [0093] and [0094], S is

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unknown because it has not been defined. Therefore, without undue experimentation, it is unclear for one skilled in the art how to calculate the damage values D1 and D2 with undefined S.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11-1. Claims 1, 2, 27, and 28 recite the limitation “the nature of the rotary member” at the end of each claim. There is insufficient antecedent basis for this limitation in each claim.

11-2. Claim 18 recite the limitation “the number of loading cycles” at lines 2-3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

11-3. Claims not specifically rejected above are rejected as being dependent on a rejected claim.

### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-19 and 22-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hara et al., U.S. Patent 5,723,779 issued March 3, 1998.

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**13-1.** Regarding claim 1, Hara et al. disclose a method for predicting life-affecting damage on a rotary member to be subjected to repeated loading during operation, said method comprising: measuring a number of operating parameters (for example, control oil pressure, loading time, column 3, lines 38-56) and calculating a temperature increase during each loading based on said operating parameters (*k<sub>3</sub>·Ec·t*, column 4, line 9); calculating a total temperature in a part of the rotary member for each loading by summation of a basic temperature of the rotary member before the loading concerned and said temperature increase (*Temp*, column 4, lines 6-9); utilizing the values for the total temperature as a measure of said damage and wherein that part of the rotary member for which the total temperature is calculated defines a surface acted on when the rotary member is loaded (facing temperatures, column 4, lines 11-23) and two sets of predetermined functions (K, L; M, N), each comprising at least one function, are used for temperature-increase calculation (formulas, column 3, line 62 through column 4, line 4); and utilizing the sets used for temperature-increase calculation and making a selection depending on at least the nature of the rotary member (formulas, column 3, line 62 through column 4, line 9).

**13-2.** Regarding claim 2, the method claim includes equivalent method limitations as in claim 1 and are anticipated using the same analysis of claim 1.

**13-3.** Regarding claims 3 and 4, Hara et al. further disclose wherein the time for which the rotary member (2) is applied is measured, and in the set of functions (K, L; M, N) which is used for each specific temperature-increase calculation is also selected depending on this time (measuring a loading time, column 3, lines 46-49).

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13-4. Regarding claims 5 and 6, Hara et al. further disclose wherein a constant ( $F_o$ ) is calculated after every loading on the basis of both the nature of the rotary member and the loading time ( $\Delta N \cdot t$ , column 4, lines 6-9), in that when a calculated value of the constant lies below a predetermined limit value, a first set of functions is used, and in that when a calculated value lies above said limit value, a second set of functions is used (derived from the formulas, Temp is a function of  $\Delta N \cdot t$ , column 3, line 62 through column 4, line 4).

13-5. Regarding claims 7 and 8, Hara et al. further disclose wherein the specific function ( $M1$ ,  $M2$ ;  $N1$ ,  $N2$ ) which is to be used for temperature-increase calculation is selected from a specifically selected set of functions depending on loading type (loaded energy, column 4, lines 1-4).

13-6. Regarding claims 9 and 10, Hara et al. further disclose wherein each of said sets comprises only one function ( $K$ ,  $L$ ), which is thus selected irrespective of loading type (Temp, column 4, lines 6-9).

13-7. Regarding claims 11 and 12, Hara et al. further disclose wherein each of the graphs of said functions has such a shape that a logarithmic first expression for the temperature increase changes linearly as a function of a logarithmic second expression for the nature of the rotary member (derived from the formula:  $\text{Temp} - T_{oil} = k_3 \cdot Ec \cdot t$ , column 4, lines 6-9).

13-8. Regarding claims 13 and 14, Hara et al. further disclose wherein said second expression is calculated as a power function of a result of the duration in time of the loading divided by a value for the nature of the rotary member (derived from the formula:  $t/(I/\Delta N)$ , column 4, lines 1-9).



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**13-9.** Regarding claim 15, Hara et al. further disclose wherein the total temperature value produced, or a converted damage value, for each loading instance is stored in a position in a memory, which position defines a specific temperature range or damage range (predetermined temperature ranges, column 4, lines 11-23).

**13-10.** Regarding claim 16, Hara et al. further disclose wherein the damage or consumed life is calculated on the basis of the number of times each specific range has been reached (real application totalizing times, column 4, lines 54-66) and knowledge of the damage durability of, the rotary member (life average values, column 4, lines 38-51).

**13-11.** Regarding claim 17, Hara et al. further disclose wherein the damage or the consumed life is calculated with a part damage theory (indicates a life which has been consumed, column 4, line 11 through column 5, line 19).

**13-12.** Regarding claim 18, Hara et al. further disclose wherein the relationship between the total temperature and the number of loading cycles is described as a power function (real application totalizing times, column 4, lines 54-66).

**13-13.** Regarding claim 19, Hara et al. further disclose wherein the time between two successive loadings is determined, and a new basic temperature for the later loading is determined (detecting a temperature of working fluid, column 3, lines 44-46).

**13-14.** Regarding claim 22, Hara et al. further disclose wherein the measured operating parameters comprise pressure applied to the rotary member, rotational speed of the rotary member and also the time for which the rotary member is applied (control oil pressure, differential revolution, loading time, column 3, lines 38-56).

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13-15. Regarding claim 23, Hara et al. further disclose wherein the rotary member is disk-shaped (multiple friction clutch, column 3, lines 38-41).

13-16. Regarding claim 24, Hara et al. further disclose wherein the rotary member consists of a disk in a clutch or brake (multiple friction clutch, column 3, lines 38-41).

13-17. Regarding claim 25, Hara et al. further disclose wherein the rotary member consists of a gearwheel in a gear train (multiple friction clutch, column 3, lines 38-41).

13-18. Regarding claim 26, Hara et al. further disclose wherein the rotary member consists of a component of a vehicle (multiple friction clutch, column 3, lines 1-14).

13-19. Regarding claims 27-28, these computer program product claims include equivalent method limitations as in claim 1 and are anticipated using the same analysis of claim 1.

### *Conclusion*

14. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Reference to Fatemi et al., "Cumulative Fatigue Damage and Life Prediction Theories: A Survey of the State of the Art for Homogeneous Materials", International Journal of Fatigue, January 1998, pages 9-34, is cited as disclosing a survey of life prediction theories.

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

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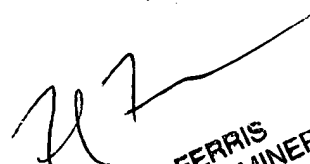
If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day

December 11, 2006

H.D.

  
FRED FERRIS  
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